**DUGWAY PERMIT**

**MODULE VII**

# ATTACHMENT 9

# HWMU 47
# POST-CLOSURE PLAN

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## 1.0 INTRODUCTION

There are three objectives of this post closure plan; 1) Ensure Dugway Proving Ground (Dugway or DPG) complies with the post closure permit issued by the State of Utah in accordance with Title 40 Code of Federal Regulations (CFR) §264.117, with respect to post closure requirements; 2) protection of potable groundwater in the confined aquifer by monitoring horizontal and vertical migration of contamination of groundwater; and 3) inspection and tracking and inspections to ensure industrial site use. In accordance with Title 40 Code of Federal Regulations (CFR) §270.28 and Utah Administrative Code (UAC) R315-3-2.19,, the post-closure plan is required to include specific information for a closed facility. As applicable to Hazardous Waste Management Unit (HWMU) 47, the information requirements include:

- General description of the facility;
- Description of security procedures;
- Copy of general inspection schedule;
- Preparedness and Prevention Plan;
- Facility location information (including seismic and flood plain considerations);
- Closure Plan or Closure Proposal;
- Certificate of Closure;
- Topographic map, with specific scale;
- Summary of groundwater monitoring data; and
- Identification of uppermost aquifer and interconnected aquifers.

Table 1 provides the regulatory citations for the general information requirements and the specific locations in the Post-Closure Plan where the specific information is presented.

**Table 1: Summary of HWMU 47 Post-Closure Information Requirements Under 40 CFR §270.14, UAC R315-3-2.19 and R315-3.2.5**

| Regulation Citation | Requirement Description | Location Requirement is Addressed |
|---|---|---|
| 40 CFR §270.14(b)(1) UAC R315-3.2.5(b)(1) | General Description of the Facility | Section 2.0 |
| 40 CFR §270.14(b)(4) UAC R315-3.2.5(b)(4) | Description of Security Procedures | Section 3.0 |
| 40 CFR §270.14(b)(5) UAC R315-3.2.5(b)(5) | General Inspection Schedule | Section 7.2, Module VII Table VII-3, and Module VII Form A |
| 40 CFR §270.14(b)(6) UAC R315-3.2.5(b)(6) | Preparedness and Prevention | Section 4.0 |
| 40 CFR §§270.14(b)(11)(i-ii, v) UAC R315-3.2.5(b)(11) (i-ii, v) | Facility Location Information Applicable seismic standard | Section 5.0 |
| 40 CFR §§270.14(b)(11) (iii-v) UAC R315-3.2.5(b)(11) (iii-v) | Facility Location Information 100-year floodplain | Section 6.0 |
| 40 CFR §270.14(b)(13) UAC R315-3.2.5(b)(13) | Copy of the Closure Plan | Final Closure Certification Report, submitted July 2004 for public comment. |
| 40 CFR §270.14(b)(14) UAC R315-3.2.5(b)(14) | Closure Certification and Notification | Section 9.0 and Appendix A |
| 40 CFR §270.14(b)(16) | Post-Closure Cost Estimate | Federal Facilities are exempt |

**Table 1: Summary of HWMU 47 Post-Closure Information Requirements Under 40 CFR §270.14, UAC R315-3-2.19 and R315-3.2.5**

| Regulation Citation | Requirement Description | Location Requirement is Addressed |
|---|---|---|
| UAC R315-3.2.5(b)(16) | | from this requirement. |
| 40 CFR §270.14(b)(18)<br>UAC R315-3.2.5(b)(18) | Proof of Financial Coverage | Federal Facilities are exempt from this requirement. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3.2.5(b)(19) (i) | Topographic Map<br>Map Scale and Date | Figure 2 (1 inch = 1,000 feet). |
| 40 CFR §270.14(b)(19)<br>UAC R315-3.2.5(b)(19) (ii) | Topographic Map<br>100-year floodplain area | Section 6.0; HWMU 47 is not located within a verified 100-year floodplain area; Figure 2. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3.2.5(b)(19) (iii) | Topographic Map<br>Surface waters including intermittent streams | There are no natural surface waters in the vicinity of HWMU 47. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3.2.5(b)(19) (iv) | Topographic Map<br>Surrounding land uses | HWMU 47 is within a military base; Figure 2. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3.2.5(b)(19) (v) | Topographic Map<br>A wind rose (i.e., prevailing windspeed and direction) | There are no residential populations in close vicinity of HWMU 47. The closest residential area is English Village (approximately 2 miles away). A wind rose is not deemed necessary for HWMU 47. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3.2.5(b)(19) (vi) | Topographic Map<br>Orientation of Map, North Arrow | Figure 2. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3.2.5(b)(19) (vii) | Topographic Map<br>Legal boundaries of the hazardous waste management facility | Legal boundaries have not been established at DPG for former HWMUs. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3.2.5(b)(19) (viii) | Topographic Map<br>Access control, fence, gates | Access control for the site was not deemed necessary due to remedial actions undertaken and due to the remote location of HWMU 47; Figure 2. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3.2.5(b)(19) (ix) | Topographic Map<br>Injection and withdrawal wells | There are no injection or withdrawal wells in the vicinity of HWMU 47. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3.2.5(b)(19) (xi) | Topographic Map<br>Barriers for drainage or flood control | Drainage barriers present in the vicinity of HWMU 47 are for the control of treated sewage effluent. There are no flood control structures on or in the vicinity of HWMU 47; Figure 2. |
| 40 CFR §270.14(c)<br>UAC R315-3.2.5(c)(1) | Groundwater Monitoring Information | Not applicable. No post-closure groundwater monitoring is |

**Table 1: Summary of HWMU 47 Post-Closure Information Requirements Under 40 CFR §270.14, UAC R315-3-2.19 and R315-3.2.5**

| Regulation Citation | Requirement Description | Location Requirement is Addressed |
|---|---|---|
| | Summary of Groundwater Data | required at HWMU 47. |
| 40 CFR §270.14(c)<br>UAC R315-3.2.5(c)(2) | Groundwater Monitoring Information<br>Identification of uppermost aquifer | Not applicable. No post-closure groundwater monitoring is required at HWMU 47. |
| 40 CFR §270.14(c)<br>UAC R315-3.2.5(c)(3) | Groundwater Monitoring Information<br>Delineation of the Waste Management Area | Not applicable. No post-closure groundwater monitoring is required at HWMU 47. |
| 40 CFR §270.14(c)<br>UAC R315-3.2.5(c)(4) | Groundwater Monitoring Information<br>Extent of Plume | Not applicable. No post-closure groundwater monitoring is required at HWMU 47. |
| 40 CFR §270.14(c)<br>UAC R315-3.2.5(c)(5) | Groundwater Monitoring Information<br>Detailed Plans/Engineering Report for Proposed Groundwater Program | Not applicable. No post-closure groundwater monitoring is required at HWMU 47. |
| 40 CFR §270.14(c)<br>UAC R315-3.2.5(c)(6)(i) | Groundwater Monitoring Information<br>Proposed List of Parameters | Not applicable. No post-closure groundwater monitoring is required at HWMU 47. |
| 40 CFR §270.14(c)<br>UAC R315-3.2.5(c)(6)(ii) | Groundwater Monitoring Information<br>Proposed Groundwater Monitoring System | Not applicable. No post-closure groundwater monitoring is required at HWMU 47. |
| 40 CFR §270.14(c)<br>UAC R315-3.2.5(c)(6)(iii) | Groundwater Monitoring Information<br>Background Values | Not applicable. No post-closure groundwater monitoring is required at HWMU 47. |
| 40 CFR §270.14(c)<br>UAC R315-3.2.5(c)(6)(iv) | Groundwater Monitoring Information<br>A description of the Proposed Sampling | Not applicable. No post-closure groundwater monitoring is required at HWMU 47. |

## 2.0 FACILITY DESCRIPTION

The following provides a general description of Dugway Proving Ground (DPG) and former HWMU 47, also known as the Former English Village Sewage Lagoons at Dugway Proving Ground (Dugway), as required by UAC R315-3.2.5(b)(1).

## 2.1 HWMU 47 LOCATION AND HISTORY

The HWMU 47 site is located approximately two miles southwest of English Village, on the eastern side of DPG (Figure 1). HWMU 47 encompassed the former sewage treatment system for English Village and Fries Park. It also included the abandoned portion of the sewage collection piping system commencing at Manhole-EF13 located just opposite Stark Road from Fries Park and proceeding to the two former

sewage lagoons (Figure 2). Also included in HWMU 47 were process and flow control equipment such as the flow control boxes, effluent and transfer piping, electrical equipment, enclosures, vaults, a gauging station located south of the lagoons, appurtenances and environmental media associated with the former discharge ditch which runs westward from near the northwest corner of the west lagoon, and the current discharge area which runs westward from the southern end of the lagoons.

## 2.2 PAST OPERATIONS

The sewage lagoons at the site were in operation from 1963 to 1994. The lagoons received sanitary wastewater from the English Village and Fries Park sanitary sewer systems, where some industrial wastes were reportedly disposed (Ebasco, 1994). The two former lagoons are lined with native clay of varying thickness. The lagoon system discharged during winter and spring to the former discharge area, which consisted of a drainage ditch that flowed to a small pond area.

In 1989 a system upgrade was started but not completed. The western lagoon and the discharge area were closed. The current discharge area began receiving effluent from flow control structures located near the south side of the eastern lagoon. Work proceeded to retrofit the former sewage system with a chlorine contact chamber and additional electrical equipment. However, this work was abandoned prior to placing these structures into service, when the decision was made to construct an entirely new sewage treatment system immediately east of the two former lagoons.

In 1994, the new sewage lagoons were completed, and the eastern lagoon was closed. In 1995, the new lagoons commenced sewage treatment and discharge of treated effluent to the current discharge area.

## 2.3 PREVIOUS INVESTIGATIONS DOCUMENTATION

The detailed results of previous material, soil, and groundwater sampling, and closure information including the risk assessment are available, for HWMU 47, in the DSHW public documents listed below in Table 2 (UAC R315-3.2.5(b)(13)).

**Table 2: DSHW Library Documents Detailing HWMU 47 Investigations and Remediation**

| Document Title | Received Date | DSHW Library No. |
|---|---|---|
| Harry Keith and Sons, Inc., 1990. *Dugway Proving Ground, Baker/English Village Wastewater Lagoons Sludge Sampling and Analysis Report.* June. | 6/27/1990 | DPG 00036 |
| IT, 2002a. *Final Supplemental Field Investigation Report (SFIR) for HWMU 47 Nature and Extent Soil Investigation,* Dugway Proving Ground. November. | 12/04/2002 | DPG 00313 |
| Shaw Environmental, Inc., 2003. *Remedial Action Plan Hazardous Waste Management Unit 47 Former English Village Sewage Lagoons,* Dugway Proving Ground, Dugway, Utah. June. | 7/25/2003 | DPG 00359 |
| Shaw Environmental, Inc., 2004. *Closure Certification Report for HWMU 47 Former English Village Sewage Lagoons,* Dugway Proving Ground, Dugway, Utah. July. | 8/25/2004 | DPG 00438 |

## 2.4 CLOSURE ACTIVITIES

Dugway has completed closure actions for HWMU 47, and the site meets the risk-based closure criteria for future commercial/industrial site use, as specified in UAC R315-101. The remedial activities performed at HWMU 47 are described in detail in the Final Closure Certification Report, Hazardous Waste Management Unit 47, Former English Village Sewage Lagoons, Dugway Proving Ground, Shaw Environmental Inc., July 2004.

The remediation activities completed at HWMU 47 included the removal and disposal of all wastes and the removal of the facilities associated with the former operation of the lagoons. The following wastes were removed and disposed in accordance with the state and federal regulations: (1) 751.5 tons of lagoon sludge disposed as hazardous wastes and (2) 15.5 tons of transite piping. The following lagoon structures and appurtenances were demolished and removed: chlorine contact basin, chlorine contact chamber, aeration equipment and associated electrical controls, flow control structures, electrical vaults, sewer manholes, and influent pipeline system. Demolition of these structures resulted in the generation of nonhazardous wastes, including approximately (1) 1,881 gallons of liquids; (2) 554 tons of concrete debris; and (3) 17.3 tons of miscellaneous construction debris (wood, rebar). These wastes were disposed at DPG Landfill, along with approximately 1.6 tons of metal material that was recycled through the landfill. In addition, 7,326 cubic yards of biosolids certified as non-hazardous by the State of Utah were removed from the HWMU 47 lagoons. The biosolids have been transported to HWMU 43 for use in augmenting the vegetative landfill cover.

## 2.5 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

Human health and ecological risk assessments were conducted and indicated that the remaining residual arsenic contamination in the soil does not pose an unacceptable risk to industrial users as defined in R315-101. The cancer risk is less than 1E-04 and the Hazard Index is less than one. Since the waste has been removed, there is not any potential for escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, surface waters, or to the atmosphere. The residual contamination in the soil is not considered a source of groundwater contamination..

The human and ecological risk assessments are presented in the Final Closure Certification Report for Hazardous Waste Management Unit 47, Dugway Proving Ground, Dugway, Utah (Shaw Environmental, Inc., July 2004).

## 2.6 SURFACE WATER AND GROUNDWATER

There are no natural surface water bodies in the area of HWMU 47. The active sewer lagoon treatment system located to the east of HWMU 47 currently discharges its treated effluent to an approximately 1,600 foot long unlined ditch that is located south of HWMU 47 (Figure 2). The discharge ditch leads into a discharge pond and wetland area located approximately 1,200 feet (ft) west of HWMU 47.

A groundwater well system meeting the requirements of R315-7-13 was established at HWMU 47 prior to closure. The wells where sampled for a variety of chemicals several times over about a ten (10) year period. The sample and water elevation data are presented in the reports referenced in Section 2.3 above. Based on evaluation of these data, the approved closure report concluded the lagoon did not release contamination to groundwater and, therefore, post closure groundwater monitoring is not required.

## 2.7 CLOSURE NOTIFICATIONS

The Certification of Closure (Appendix A) was received and verified by the Executive Secretary of the Utah Solid and Hazardous Waste Control Board in November 5, 2004.

Federal facilities are exempt from submitting notifications to the local zoning authority as required by 40 CFR §§264.116 and 264.119, which are incorporated by reference in UAC R315-8-7.

## 3.0 SECURITY REQUIREMENTS

HWMU 47 is located within a federal, military installation (Dugway Proving Ground). As such, access to the installation is restricted for the common population. Dugway's Base Security (Range Control) shall monitor access to HWMU 47.

## 4.0 PREPAREDNESS AND PREVENTION MEASURES

All wastes have been removed from HWMU 47. The Dugway Emergency Response and Contingency Plan (Part B Permit), where applicable to this site shall be used to announce and respond to emergency conditions. At a minimum, the site inspector should have a radio or phone and a First Aid kit available during inspections.

## 5.0 SEISMIC STANDARD

HWMU 47 is not located within 200 feet of any active faults. Although Utah is tectonically active, most of the earthquake activity occurs about 55 miles to the east along the Wasatch Range Foothills.

A geologic map completed in a study (1988) by the United States Geological Survey (USGS), Map of Fault Scarps Formed on Unconsolidated Sediments, Tooele 1°x2° Quadrangle, Northwestern Utah. (Compiled by T.P. Barnhard and R.L. Dodge), was used to determine the distribution, relative age, and amount and extent of surface rupture on Quaternary fault scarps, in the area of HWMU 47.

The USGS study (1988) concluded that morphologic and geologic data collected along the fault scarps in the area indicate that all were formed during the later Pleistocene era and there is not any clear evidence of Holocene surface rupture. Several faults inferred on geophysical evidence are located at Dugway; however, there is no evidence of displacement during Holocene time.

## 6.0 FLOODPLAIN STANDARD

HWMU 47 is not located within a 100-year verified floodplain.

The National Flood Insurance Rate Map, identifying the boundary of the 100-year flood, does not include Dugway. These are no permanent streams or other surface water bodies on Dugway.

Surface water from precipitation flows through well-established drainage channels into the flat plain and evaporates. Like other arid regions, Dugway is subject to flash flooding following high-precipitation events. Flash floods have occurred only four times in the history of the installation, in 1944, 1952, 1973, and 1983. The major area affected during flash floods has been the Government Creek drainage channel, which has overflowed and caused minor inundation of roads at the Ditto Technical Center.

## 7.0 POST-CLOSURE INSPECTIONS

## 7.1 INTRODUCTION

HWMU 47 has been closed under a continued industrial use scenario, which prohibits residential use in the areas formerly occupied by the site. To ensure that the area is not reused or developed for residential purposes, annual site inspections and a biennial report shall be required.

## 7.2 ANNUAL INSPECTIONS

General site inspections of the former HWMU 47 site shall be conducted annually before November 1st, to ensure that the former site remains under industrial use and to verify the Dugway Dig Permit process as described in Module VII.I has been followed. The general post-closure site inspection checklist for industrial use sites should be used. This is included as Form A in Module VII. Completed inspection forms shall be filed with the Dugway Environmental Office. The site shall be visually inspected to ensure the following conditions are maintained at the site:

1. There is no evidence of land use other than for industrial purposes within the former site boundary; and
2. Inspect for evidence of soil disturbance.

Table 3 summarizes the Post-Closure Inspection Schedule for HWMU 47, and lists the items to be inspected. Inspection personnel shall note any problems found and shall inform appropriate Dugway representatives.

**Table 3: HWMU 47 Post-Closure Inspection and Monitoring Schedule**

| Inspection/Monitoring Item | Method of Documentation | Frequency of Inspection |
|---|---|---|
| Land Use | General Post-Closure Site Inspection Checklist (Module VII Form A) | Annual Inspection conducted before November 1st. |

## 7.3 INSPECTION FOLLOW-UP

Copies of completed site inspection checklists (Module VII Form A) shall be forwarded to the Dugway Environmental Office. The Point-of-Contact for the Dugway Environmental Office is as follows:

Environmental Programs Compliance Representative
Dugway Proving Ground Environmental Program Office
Attn: STEDP-DEP, Bldg. 5330
Dugway, UT 84022
Telephone: (435) 831-3560

The Dugway Environmental Office shall notify the appropriate personnel to implement corrective action as needed.

Corrective action shall be initiated as soon as practical after identifying the problem. If the corrective action requires substantial effort, a technical plan shall be prepared to summarize the problem, the

potential impacts, the proposed plan for action, and the time-frame in which corrective action shall be implemented as required under this Permit. This plan shall be approved by the Executive Secretary and shall be submitted within 30 days of Dugway's decision to implement corrective action.

## 8.0 SUBMITTALS/REPORTING

Based on the evaluation presented in Final Closure Certification Report for HWMU 47, no post closure monitoring, including groundwater monitoring, is required for HWMU 47.

## 8.1 NON-COMPLIANCE REPORTING

The conditions at HWMU 47 are such that the impact to human health and the environment is very unlikely. All wastes and associated structures have been removed from the site. Hazardous wastes are no longer managed or maintained at the site. Nonetheless, if there is any type of non-compliance with any condition of this Permit, notifications shall be submitted per Permit Conditions VII.C.5.

## 8.2 BIENNIAL POST-CLOSURE REPORT

In accordance with UAC R315-3-3.1(l)(9), a Biennial Post-Closure Report shall be prepared for all closed HWMUs and SWMUs undergoing post-closure care. Post Closure Reports shall be submitted to DSHW no later then March 1st, of the following year that the report is due. The first Post-Closure reporting year is 2007 for HWMU 47. The report shall be submitted no later than March 1st of 2008. Specifically for HWMU 47, the Biennial Post-Closure Report shall include, at a minimum, the following:

- General site description and conditions; and
- Inspection records.

## 8.3 REQUIRED SUBMITTALS

Table 4 summarizes the requirements for the Biennial Post-Closure Report for HWMU 47 and reporting for any non-compliance.

**Table 4: Summary Table of Required Submittals**

| Required Submittals | Frequency and Submittal Date |
|---|---|
| Biennial Post-Closure Report | Post Closure Reports shall be submitted to the Division of Solid and Hazardous Waste no later than March 1st, of the following year that the report is due. Reporting years are odd numbered years beginning with March 1, 2007, for the duration of the Post-Closure Monitoring Period. |
| Non-Compliance Reporting | |
| 1. Anticipated Non-Compliance (VII.C.5) | 1. 30 days advance notice of any change which may result in non-compliance. |
| 2. 24-hour Notification for information concerning the non-compliance, which may endanger public drinking water supplies or human health or the environment (VII.C.5) | 2. Orally within 24 hours of discovery |
| 3. Five-day written notification for information concerning the non-compliance, which may endanger public drinking water supplies or human health or the environment. The Executive Secretary may waive the 5-day notice, in favor of a 15-day notice (VII.C.5) | 3. Within 5 days of discovery |
| 4. Written notification for information concerning the non-compliance, which does not endanger human health or the environment (VII.C.5). | 4. Submitted with the Biennial Post Closure Report |

## 9.0 POST-CLOSURE CERTIFICATION

No later than 60 days after post-closure activities are completed and approved by the Executive Secretary, Dugway shall submit a certification to the Board, signed by Dugway and an independent professional engineer registered in the State of Utah, stating why post-closure care is no longer needed.

## 10.0 REFERENCES

Barnhard, T.P. and R.L. Dodge, 1988. *Map of Fault Scarps Formed on Unconsolidated Sediments, Tooele $1^o$ x $2^o$ Quadrangle, Northwestern Utah*, United States Geological Survey.

Ebasco, 1994. *Solid Waste Management Unit (SWMU) Closures at Dugway Proving Ground, Interim Report, Preliminary Draft, Volume 2, Appendices.* November.

Harry Keith and Sons, Inc., 1990. *Dugway Proving Ground, Baker/English Village Wastewater Lagoons Sludge Sampling and Analysis Report*. June.

IT Corporation (IT), 2002a. *Final Supplemental Field Investigation Report for HWMU 47 Nature and Extent Soil Investigation, Dugway Proving Ground*. November.

James M. Montgomery Consulting Engineers (JMM, 1990). *Supplemental Sludge Sampling Report, English Village and Baker Lagoons, Dugway Proving Ground, Utah, Contract Number DACA05-89-C-0016*. February.

Shannon and Wilson, Inc., 1992. *Environmental Study English Village Lagoon, Dugway Proving Ground, Utah.* November.

Shaw Environmental, Inc. (Shaw), 2003. *Remedial Action Plan Hazardous Waste Management Unit 47 Former English Village Sewage Lagoons, Dugway Proving Ground, Dugway, Utah.* June.

Shaw, 2004. *Final Closure Certification Report, for HWMU 47, former English Village Sewage Lagoons, Dugway Proving Ground, Utah*. July.

# DUGWAY PERMIT

# MODULE VII

# ATTACHMENT 9

# APPENDIX A

# HWMU 47

# CERTIFICATE OF CLOSURE

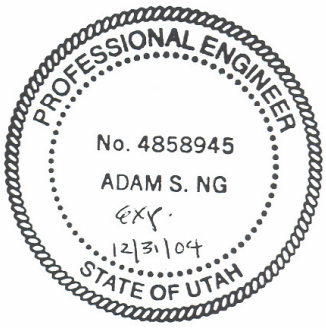
## CERTIFICATION OF CLOSURE

The Closure Certification Report for Hazardous Waste Management Unit (HWMU) 47 at Dugway Proving Ground, Utah has been prepared by Shaw Environmental in accordance with the closure requirements specified under the Utah Administrative Code (UAC) 315-7-14 and 40 Code of Federal Regulations 265, Subparts G and K for closure of HWMU 47. The requirements of UAC 315-101 form the basis for the risk-based criteria in the closure of HWMU 47.

In accordance with 40 CFR 265.115, the signature and seal certify that a licensed professional has reviewed the Closure Report in accordance with the above referenced regulatory requirements.

Respectfully submitted,

Scott Reed
Directorate of Environmental Programs
Dugway Proving Ground

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# MODULE VII

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# HWMU 47

# FIGURES